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Clark is quoted as stating that in this region "the antelope is said to have an abiding hatred for the rattlesnake, which it decoys first into a striking attitude and then utterly annihilates by leaping into the air and coming down upon the snake with its four sharp-cutting hoofs placed together." (See the illustration in the NATURALIST on p. 179.)

The birds are being treated in the same manner as the mammals by Messrs. Salvin and Godman; the reptiles, amphibians and fishes, by Dr. Günther; the mollusks, by Dr. E. von Martens; the crustacea, by Professor Huxley; the arachnida, by Rev. O. P. Cambridge; the coleoptera, by H. W. Bates and others, including Dr. D. Sharp and C. O. Waterhouse; the hymenoptera, by P. Cameron; the butterflies, by Godman and Salvin, and the moths by H. Druce; the neuroptera, by Mr. McLachlan; the orthoptera, in part, by J. Wood Mason, and the rhynchota, by W. L. Distant. The botanical portion is entirely in the hands of Mr. W. B. Hensley.

RECENT WORKS ON THE MOUTH-PARTS OF FLIES.[1]—The object of this notice is simply to draw attention to some excellent recent works on the structure and morphology of the mouth-parts of insects, particularly the flies. Dr. Dimmock's memoir is largely devoted to the parts of the mosquito's mouth, and is therefore of considerable popular interest; but the author's object was not simply to describe the anatomy of the mouth-parts of this familiar insect alone, but to give a general comparative account of those of Diptera in general. As Dr. Dimmock says: "The few Diptera whose mouth-parts have been the object of the anatomical studies, the results of which are noted in the following pages, were chosen, on the one hand, with especial reference to their presenting a series beginning with a species possessing simple, separate and fully-developed mouth-parts, and ending with a species of which the complexity of the mouth-parts was due to coalescence and incomplete development of their different elements, and, on the other hand, with partial reference to forms whose mouth-parts were of sufficient length to render their study of sections, made with the microtome, of value in determining their relative length, their positions and their attachments. With the above-mentioned objects in view species of the genera Culex, Bombylius, Eristalis and Musca were chosen." The figures are well drawn, with transverse sections of the proboscis and longitudinal sections, showing in an instructive manner the relations of the œsophagus to the mouth and proboscis.

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[1] *The Anatomy of the mouth-parts and of the sucking apparatus of some Diptera.* Dissertation for the purpose of obtaining the Philosophical Doctorate at the Leipzig University. By GEORGE DIMMOCK. Boston, A. Williams & Co., 1881. 4to, pp. 50. 4 plates.

Fluernes Munddele. Trophi Dipterorum. Af FR. MEINERT. Kjöbenhavn, 1881. 4to, pp. 91. 6 plates.

Zur Kenntniss der mundtheile der Dipteren. Von EDUARD BECHER. Besonders abgedruckt aus dem XLV. Bande der Denkschriften der Math.-Naturwissen. classe der K. Akad. der Wissenschaften. Wien, 1882. 4to, pp. 42. 4 plates.

It appears that complicated as are the mouth-parts of the Diptera, the mandibles are least developed, or most often absent. They are present in the female Culex, but are absent in Eristalis, Bombylius, Musca and many other Diptera.

The maxillæ are, next to the mandibles, the oftenest absent in Diptera, but the maxillary palpi are usually, probably always, present. The labium is the most fully developed part of the mouth, the large fleshy lobes so well developed in the house fly being termed the *labellæ.* It appears that the mouth-parts are most developed in the mosquito, which for this and other reasons stands at the head of the Diptera.

As to the poisonous nature of the mosquito's bite Dr. Dimmock's views may be considered as most probably correct. He says: "After having experimented a large number of times with the living mosquito, I am convinced that there is use made of a poisonous saliva. * * * When the insect is allowed to draw its fill on the back of my hand, the subsequent swelling lasts from forty to forty-eight hours, and the amount of poisonous effect upon me, as proved by numerous experiments, is in direct proportion to the length of time which the Culex has occupied in actually drawing blood. The above-mentioned facts would indicate a constant outpouring of some sort of poisonous fluid during the blood-sucking process, and would necessitate a tube or channel for its conduction. Now, no other channel exists through which saliva could pass from the base to the tip in the mouth-parts which Culex inserts in the skin, and this, together with the position occupied by the salivary duct in other Diptera, leads me to believe, without as yet being able to give anatomical proof of it, that the hypopharynx of Culex contain a duct that pours out its poisonous saliva."

Dr. Meinert's memoir is very well illustrated; it is in Danish, with a brief Latin synopsis. His work, while exact in its description of actual parts, appears to us to be lacking in philosophic breadth. For instance, he has some singular views as to the general homologies of the trophi of insects, especially Diptera. He uses Kirby and Spence's terms *cultellus* for mandibles and *scalpella* for the maxillæ of Diptera. But his illustrations of the trophi of numerous Diptera are made with great apparent care and faithfulness.

Becher's work is not so well illustrated as the foregoing, though the number of genera represented is greater, as types of each dipterous family are represented; the descriptions are rather brief. None of the authors compare the mouth-parts of the flea with those of other Diptera, Becher only figuring the underlip of Pulex.

The latest article is a short preliminary one by Dr. Kraepelin, in the *Zoölogischer Anzeiger* (1882), translated in the Journal of the Royal Microscopical Society for February. This paper is on the mouth-organs of sucking insects. After describing the mode of taking food in the bees and bugs, which we refer to at another place, he deals at greater length with the Diptera. He dissents from Dimmock's and Meinert's view, that the labium of these flies is made up of the labium proper and the epipharynx, but considers the paired organs described by Meinert in Hippobosca, &c., as an independently formed epipharynx, to be enormous developments of the cheeks. The tactile hairs of the labella are connected with nerves, and organs of taste are situated on the labella or fleshy "tongue." He confirms the opinions of previous observers as to the pumping arrangements of the salivary glands and the sucking apparatus of the pharynx.

MARTIN AND MOALE'S HOW TO DISSECT A BIRD.[1]—A handy little volume is this, the second part of Messrs. H. N. Martin and W. A. Moale's "Hand-book of Vertebrate Dissection." To begin by finding fault, almost the only fault that there is to find, and one that is doubtless caused by the low price at which the book is issued—the illustrations are too few and too rudimentary.

The pigeon is taken as a type, and has the advantage of being readily accessible to all. The work begins by giving the zoölogical characters of the division, class and sub-order. Those of the order are omitted, and the character "sternum provided with a keel," is rather that of the order Carinatæ than that of its sub-order, Schizognathæ. The external characters of head, trunk, limbs, feathers and skin are first described, and the student is next directed how to prepare and examine the skeleton. This is followed by the dissection of the soft parts, the neck, pleuro-peritoneal cavity, veins and arteries, vocal, abdominal and reproductive organs, brain and cranial nerves, eye and ear. Clear and concise directions are everywhere given, enabling any student of ordinary dexterity and application not only to dissect a pigeon, but, better still, to dissect some other carinate bird, and note carefully the points of distinction between it and the pigeon.

MAYER'S MONOGRAPH OF THE CAPRELLIDÆ.[2]—The Caprellidæ constitute a sub-division of Amphipod Crustacea of singularly attenuated form, with less than the usual number of legs, and otherwise modified. After describing the species of the Old World, the author, apparently from want of material which it would seem our museums might have afforded, treats in a very

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[1] Hand-book of Vertebrate Dissection. By H. NEWELL MARTIN, D. Sc., M. D., M.A., Professor in the Johns Hopkins University, and W. A. MOALE, M.D. Part II. How to Dissect a Bird. New York, Macmillan & Co. 60 cents.

[2] *Fauna and Flora des Golfes von Neapel und der Angrenzender Meeres-abschnitte*, Herausgegeben von der Zoölogischen Station zu Neapel. VI Monographie; Caprelliden. Von Dr. P. MAYER, mit 10 tafeln in lithographie und 39 zincographien. Leipzig, 1882. 4to, pp. 201.